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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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EXAMINER
SUCHECKI, KRYSTYNA

ART UNIT	PAPER NUMBER
2882	

DATE MAILED: 03/12/2003

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	09/845,685	LIN, WENHUA	
	Examiner	Art Unit	
	Krystyna Suchecki	2882	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☐ Responsive to communication(s) filed on _____ .

2a)☒ This action is **FINAL**. 2b)☐ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1,3-11,14-17,21,22 and 38-54* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1,3-11,14-17,21,22 and 38-54* is/are rejected.

7)☒ Claim(s) *6,11 and 41* is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

11)☒ The proposed drawing correction filed on *08 November 2002* is: a)☒ approved b)☐ disapproved by the Examiner.

If approved, corrected drawings are required in reply to this Office action.

12)☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

13)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____ .

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

14)☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).

a) ☐ The translation of the foreign language provisional application has been received.

15)☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☒ Information Disclosure Statement(s) (PTO-1449) Paper No(s) _____ .
4) ☐ Interview Summary (PTO-413) Paper No(s). _____ .
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: .

DETAILED ACTION

Claim Objections

1. Claim 6 is objected to because of the following informalities: The term "adjacent" is objected to for not lending a clear interpretation to the claim. Examiner assumes that by "adjacent", Applicant intends either "directly touching", or "along the sides of". Clear claim language is requisite to describe one of these, as currently the claim appears to seek to have a component altered by an effective length tuner that does not contact the component. Appropriate correction is required. Please see the rejection of Claim 6 below for a suggestion on how to incorporate the language desired by the amendment of Claim 6, as understood from Applicant's discussion in the Remarks (paper #10).

2. Claim11 is objected to because of the following informalities: "each array waveguides" is improper. The claim should refer to "each array waveguide". Appropriate correction is required.

3. Claim 41 is objected to because of the following informalities: "wedge shaped" should be "wedge shape". Appropriate correction is required.

Claim Rejections - 35 USC § 102

4. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless –
>
> (b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

5. Claims 1, 3-11, 14, 16-17, 38-43, 45-46 and 49-50 are rejected under 35 U.S.C. 102(b) as being anticipated by Guo (US 6,449,084).

6. Regarding Claim 1, Guo teaches a filter comprising:

a. A light distribution component having an output side (Figure 1b, "Optical Output");

b. A plurality of array waveguides defined in a light transmitting medium positioned on a base (Column 3, lines 32-36), the array waveguides configured to deliver a light signal into the light distribution component such that the light signal is incident on the output side of the light distribution component (Column 3, lines 32-45);

c. the light transmitting medium defining at least a portion of a groove, the groove being positioned between adjacent array waveguides such that material in the groove is located over the base and between different regions of the light transmitting medium (See in particular Figures 2A-2C, which teaches the formation of a groove between optical array waveguides and the placement of medium within the groove, the medium being above the base and between optical array waveguides); and

d. One or more effective length tuners configured to tune the effective lengths of the plurality of the array waveguides such that the location where the light signal is incident on the output side changes (Abstract).

7. Regarding Claim 3, Guo teaches effective length tuners configured to change the effective lengths of array waveguides such that the difference in the amount of effective length change between adjacent array waveguides is the same for different pairs of adjacent array waveguides. This can be seen in Guo by studying the slope of the effective length tuner 18a, which changes at a constant rate amongst waveguides (See Figures 1B), thereby causing the above cited differences.

8. Regarding Claim 4, Guo teaches the amount of the effective length change of an array waveguide as different for each array waveguide adjacent to an effective length tuner by showing a continual change in the coverage of an effective length tuner (item 18a) along the axis of propagation (Figure 1B).

9. Regarding Claim 5, Guo teaches electronics for operating the one or more effective length tuners so as to change the effective length such that the amount of the effective length change between adjacent array waveguides is a constant (Figures 1A-1D in combination with teachings on the slope of the effective length tuners).

10. Regarding Claim 6, Guo teaches an effective length tuner having a different effective area and the effective area for each effective length tuner as being positioned on the top of the light distribution component, but not positioned of the sides of the light distribution component, the effective area being the area of the effective length tuner that causes the change in effective length (Figures 1A and 1D).

11. Regarding Claim 7, Guo teaches an effective length tuner having an effective area and the difference in the effective area for adjacent array waveguides as a constant, the effective area being the area of the effective length tuner that causes the change in effective length. This can be seen in Guo by studying the slope of the effective length tuners, which change at a constant rate amongst waveguides (See Figures 1B and 1C), thereby causing the above cited differences.

12. Regarding Claim 8, Guo teaches the effective area of each effective length tuner as different (See Figures 1B and 1C, items 18A and 28A, respectively to see that each tuner covers a different length of waveguide for adjacent waveguides.)

13. Regarding Claim 9, Guo teaches each effective length tuner having an effective area with a different average length and the difference in the average length for adjacent array waveguide as a constant. This can be seen in Guo by studying the slope of the effective length tuners, which change at a constant rate amongst waveguides (See Figures 1B and 1C), thereby causing the above cited differences.

14. Regarding Claim 10, Guo teaches array waveguides each having a different average length and the difference in the average length of adjacent array waveguides as constant, the difference in the average length of adjacent array waveguides being less that the average length of the effective area for adjacent array waveguides This can be seen in Guo by studying the slope of the effective length tuners, which change at a constant rate amongst waveguides (See Figure 1B, particularly the decreasing slope of tuner 18b), thereby causing the above cited differences.

15. Regarding Claim 11, Guo teaches the length of an effective area of each effective length tuner as different for each array waveguide and the difference in the length for adjacent array waveguides as a constant. This can be seen in Guo by studying the slope of the effective length tuner 18a, which changes at a constant rate amongst waveguides (See Figure 1B), thereby causing the above cited difference.

16. Regarding Claim 14, Guo teaches the inclusion of electrical conductors to provide electrical communication between at least two effective length tuners (Column 5, lines 30-53).

17. Regarding Claim 16, Guo teaches each effective length tuner including a plurality of electrical contacts (Column 5, lines 10-29).

18. Regarding Claim 17, Guo teaches each array waveguide as at least in part defined by a ridge and at least portion of each effective length tuner as positioned over a ridge (See particulars of Figures 2A-2C).

19. Regarding Claim 38, Guo teaches a filter comprising:

e. A light distribution component having an output side (Figure 1b, "Optical Output");

f. A plurality of array waveguides configured to deliver a light signal into the light distribution component such that the light signal is incident on the output side of the light distribution component (Column 3, lines 32-45); and

g. A common effective length tuner configured to change the effective length of a plurality of the array waveguides such that the location where the light signal is incident on the output side of the light distribution component changes (Figures 1B and 1C), the effective length tuner including a first electrical contact positioned over a plurality of the array waveguides and a second electrical contact positioned under a plurality of the array waveguides (Figures 1A and 1D).

20. Regarding Claim 39, Guo teaches array waveguides defined in a light transmitting medium positioned on a base and the first electrical contact extending over a portion of the filter positioned between adjacent array waveguides (Figures 1A-1D).

21. Regarding Claim 40, Guo teaches a first electrical contact extending over a portion of the filter positioned between adjacent array waveguides (Figures 1B and 1C).

22. Regarding Claim 41, Guo teaches a first electrical contact or a second electrical contact having a wedge shape (Figure 1B).

23. Regarding Claim 42, Guo teaches a first electrical contact and a second electrical contact having a wedge shape (Figure 1B).

24. Regarding Claim 43, Guo teaches at least one side of a first electrical contact having a stair step pattern (Column 5, lines 10-12).

25. Regarding Claim 45, Guo teaches one or more effective length tuners including a first electrical contact positioned over a plurality of the array waveguides and a second electrical contact positioned under a plurality of the array waveguides (Figures 1A and 1D).

26. Regarding Claim 46, Guo teaches array waveguides as defined in a light transmitting medium positioned on a base and the interface between the light transmitting medium and the base as substantially flat (Figure 3C).

27. Regarding Claim 49, Guo teaches the groove of claim 1 as one of a plurality of grooves positioned between adjacent array waveguides (See particulars of Figures 2A-2C).

28. Regarding Claim 50, Guo teaches effective length tuners connected in series (Prticulars of Figure 1C, Column 5).

29. Claims 1, 15 and 44 are rejected under 35 U.S.C. 102(b) as being anticipated by Kasahara.

30. Regarding Claim 1, Kasahara teaches a filter (Figure 3a) comprising:

h. A light distribution component having an output side (Figure 1a, "Ports");

i. A plurality of array waveguides defined in a light transmitting medium positioned on a base, the array waveguides configured to deliver a light signal into the light

distribution component such that the light signal is incident on the output side of the light distribution component (Figure 1a, "Interferometer");

j. the light transmitting medium defining at least a portion of a groove, the groove being positioned between adjacent array waveguides such that material in the groove is located over the base and between different regions of the light transmitting medium (Figure 1b, "groove"); and

k. One or more effective length tuners configured to tune the effective lengths of the plurality of the array waveguides such that the location where the light signal is incident on the output side changes (Figures 1a and 1b, "Thin film heater").

31. Regarding Claims 15 and 44, Kasahara teaches an effective length tuner as a temperature control device positioned over a plurality of the array waveguides (Figures 1a and 1b, "Thin film heater").

32. Claims 21 and 51-52 are rejected under 35 U.S.C. 102(b) as being anticipated by Maerz (US 5,559,906).

33. Regarding Claim 21, Maerz teaches a filter comprising:

l. A light distribution component having an output side (Figure 3);

m. A plurality of array waveguides configured to deliver a light signal into the light distribution component such that the light signal is incident on the output side of the light distribution component (Column 2, lines 55-67); and

n. A temperature control device positioned over a plurality of the array waveguides so as to change the effective length of a plurality of the array waveguides such that the

location where the light signal is incident on the output side of the light distribution component changes (Column 6, lines 36-42).

34. Regarding Claim 51, Maerz teaches array waveguides defined in a light transmitting medium positioned on a base and a temperature control device extending over a portion of the light transmitting medium positioned between adjacent array waveguides (Figures 6a and 6b).

35. Regarding Claim 52, Maerz teaches a temperature control device extending over a portion of the filter positioned between adjacent array waveguides (Figures 6a and 6b).

Claim Rejections - 35 USC § 103

36. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

37. Claims 22 and 53-54 are rejected under 35 U.S.C. 103(a) as being unpatentable over Maerz in view of Guo.

38. Regarding Claims 22 and 53-54, Maerz teaches a generally wedge shape wherein tuners are joined together such that the overall effect is a wedge shape (Figure 5). Maerz also teaches the compatability of electrodes of effective length tuners as useable in electro-optical and thermo-optical systems (Summary of the Invention).

39. Maerz does not teach the effective length tuner as wedge shaped, a resistive heater having a wedge shape or the temperature control device having a stair step pattern.

40. Guo teaches the use of wedge shaped effective length tuners in order to simplify the application of voltages to affect change in an optical system (Column 5, lines 30-38). The tuner

conducts electricity and is therefore resistive. The tuner can have a stepped pattern in order to maintain longer channel length (Column 5, lines 10-12).

41. Since the tuner of Guo is for electro-optic systems, and Maerz teaches the interchangeability of electrode tuners between electro-optic and thermo-optic systems, it would have been obvious to one of ordinary skill in the art at the time the invention was made to integrate the generally wedge shaped tuners of Maerz into a wedge shaped/ resistive heater wedge shaped tuner as taught by Guo in order to simplify the application of voltages to affect change in the optical system (Guo, Column 5, lines 30-38). It would have been further obvious to incorporate the modifications of a stepped pattern in order to maintain longer channel length.

42. Claims 47-48 are rejected under 35 U.S.C. 103(a) as being unpatentable over Kasahara in view of Johnston.

43. Regarding Claims 47-48, Kasahara teaches the arrangement of Claim 1 and additionally teaches vertically isolating the waveguide core from the substrate (Introduction). The arrangement of Kasahara reduces power consumption (Introduction and Experimental). When combined with grooves between waveguides, thermal isolation is enhanced as well (Introduction).

44. Kasahara fails to teach the groove extending through the light transmitting medium and into the base or the groove extending through the light transmitting medium and undercutting the array waveguides adjacent to the groove.

45. Johnston also teaches isolating a waveguide core from a substrate (Introduction). He teaches that isolation of the waveguide core from its substrate assists in reducing power use (see

article 6 cited by Johnston). The arrangement of Johnston shows a groove extending through the light transmitting medium and into the base (Figure 4). The groove undercuts the waveguide (Figure 4).

46. Therefore, since Kasahara and Johnston have similar goals, it would have been obvious to one of ordinary skill in the art at the time the invention was made to include the groove and undercutting of Johnston in the device of Kasahara for reduced power consumption.

Response to Arguments

47. Applicant's arguments with respect to claim 1, and claims dependent upon 1, have been considered but are moot in view of the new ground(s) of rejection.

48. Applicant's arguments with respect to claims 21, and claims dependent upon 21, have been considered but are moot in view of the new ground(s) of rejection. In response to applicant's argument that the references fail to show certain features of applicant's invention, it is noted that Maerz teaches temperature control devices (Column 2, lines 3-6; Column 6, lines 36-42; and Column 7).

Conclusion

49. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure. Article to Nowak is included for your reference, as it is cited by Johnston in an article provided by Applicant.

50. Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

51. A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

52. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Krystyna Suchecki whose telephone number is (703) 305-5424. The examiner can normally be reached on M-F 8-6, with alternating Fridays off.

53. If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Robert Kim can be reached on (703) 305-3492. The fax phone numbers for the organization where this application or proceeding is assigned are (703) 872-9318 for regular communications and (703) 872-9319 for After Final communications.

54. Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is (703) 305-4900.

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March 10, 2003